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AUTHOR Braveman, Paula; And Others
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ABSTRACT

To determine whether lack of medical insurance was associated with adverse health outcomes, this study examined hospital data on newborns in California's San Francisco Bay Area. The study also sought to determine which ethnic groups were most at risk. Computerized data on all civilian acute-care hospitalizations in the study area were obtained for the last half of 1982 and all of 1984 and 1986. The sample included records on 28,345 newborn hospitalizations in 1982; 57,492 in 1984; and 60,631 in 1986. Adverse outcomes were classified as: (1) prolonged length of stay (6 days or more); (2) transfer to another acute-care hospital or long-term care facility; or (3) death. Newborns with adverse outcomes were compared with well newborns (those discharged after a stay of less than 6 days). Analyses of data revealed that in each year studied the risk of an adverse hospital stay appeared higher for uninsured infants than for privately insured newborns. Uninsured black newborns were 2.24 times more likely as privately insured black newborns to experience adverse outcomes. For uninsured Latino newborns the risk was 1.56 times greater. Both the percentage of uninsured infants and the magnitude of risks associated with a lack of insurance increased over time. Findings indicate a need for responses to the lack of health insurance in California and the United States. (MM)

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INCREASED RISK OF ADVERSE OUTCOMES IN NEWBORNS IN THE GREATER SAN FRANCISCO BAY AREA

Paula Braveman, Geraldine Oliva, Marie Grisham Miller, Randy Reiter, and Susan Egerter

Editor's note: The information presented here is summarized from an article entitled "Lack of Health Insurance and Adverse Hospital Outcomes in Newborns in an Eight-County Area of California, 1982 to 1986," published in the *New England Journal of Medicine* on August 24, 1989. While specific policy recommendations were not the focus of the study, the research results have policy implications.

The number of Californians without health insurance increased by over 50 percent between 1979 and 1986, with larger increases for blacks and Latinos. Increases in the number of uninsured persons and increases in poverty have been accompanied by reduced funding for public hospitals, community health centers, nutrition programs, and other services for low-income persons. While eligibility requirements for Medi-Cal coverage for maternity care have become less restrictive, private obstetric provider participation has decreased. Based on an absence of conclusive data on health outcomes, some policymakers have claimed that the safety net of free and public services has been adequate to prevent any real harm resulting from the lack of private insurance, and have concluded that sweeping policy changes are not necessary.

The uninsured are less likely to obtain medical care than are their insured counterparts, less likely to use preventive services, and less likely to receive adequate prenatal care. A number of studies have linked inadequate prenatal care to adverse outcomes in young infants; however, information was not available on the possible link between the lack of health insurance and adverse outcomes in young infants. Hospital data on newborns in an eight-county region of the Bay Area were studied to determine whether lack of insurance was associated with adverse health outcomes, and, if so, which ethnic groups were more at risk.

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2020 MILVIA STREET, SUITE 412
BERKELEY, CA 94704
(510) 642-5514
ATSS 8/582-5514

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METHODOLOGY

Computerized data on all civilian acute-care hospitalizations in California were obtained for the last half of 1982 (when collection of the data began) and all of 1984 and 1986 from the Office of Statewide Health Planning and Development (OSHPD). The sample was selected according to postal service criteria for the Greater San Francisco Bay Area, and included all hospitalizations of residents in the counties of San Francisco, Alameda, Contra Costa, San Mateo, and Marin, and most of Sonoma, Napa, and Solano. There were records on 28,345 newborn hospitalizations in the last six months of 1982, 57,492 in 1984, and 60,631 in 1986.

A newborn was considered to have had an adverse hospital outcome if any of the following conditions were found: (1) prolonged length of stay — six days or more, (2) transfer to another acute-care hospital or long-term care facility, or (3) death. Newborns with adverse outcomes were compared with "well" newborns, those discharged home after a stay of less than six days.

Four insurance status categories were defined: privately insured, Medi-Cal, uninsured (self-pay or indigent services), and all other payors. The risks for newborns who were privately insured were compared to the risks for newborns who were uninsured. Risks for newborns covered by Medi-Cal were not examined. The "relative risk," then, was the risk of adverse outcomes for those without any insurance compared to the risk for those with private insurance.

The definition of an adverse outcome tended to bias results *against* finding adverse outcomes for uninsured newborns. For example, babies born by Cesarean section might have had longer-than-usual hospital stays when the babies themselves were actually well; the privately insured are more likely to have Cesarean sections and some sick newborns might have stayed less than six days because of financial pressures for early discharge. This would also lower estimates of relative risks for babies lacking insurance. Also, many women who are privately insured for delivery do not have complete coverage for prenatal care; the inability to distinguish the underinsured among the privately insured implies a potential underestimation of the effect of lack of insurance. Taking these biases into account, any findings of elevated risks of adverse outcomes among the uninsured understate the extent of the problem.

FINDINGS

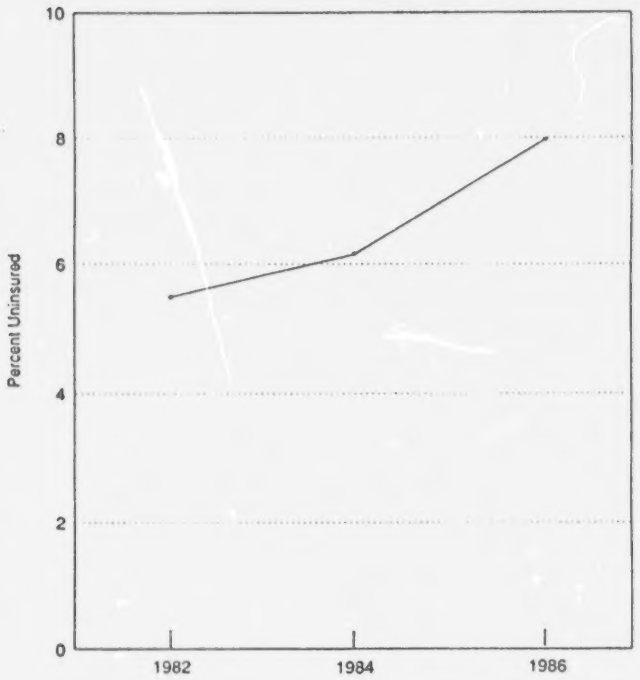
In 1982, 5.5 percent of newborns were uninsured; in 1986, 8 percent of all newborns were uninsured, a 45 percent increase in four years. See Figures 1(a) and (b). Ethnic differences among the uninsured newborns were marked. Almost 20 per- cent of Latino newborns were uninsured in 1986. The percent of Latino uninsured increased by 140 percent and Asian uninsured by 54 percent (although the proportion of newborns covered by Medi-Cal did not change significantly). All groups (including white non-Latino) showed significant increases over time in the lack of insurance.

Multivariate analysis controlling for race/ethnicity, multiple births, and (after 1982) birth defects revealed that in each year studied the risk of an adverse hospital stay appeared higher for uninsured infants than for privately insured newborns; in 1984 and 1986 the increased risk was statistically significant. The magnitude of risk also increased over time. The relative risk in 1982 was 1.11 (that is to say, the risk of an adverse outcome for an uninsured newborn was 1.11 times the risk for privately insured newborns), 1.19 in 1984, and 1.31 in 1986. See Figure 2(a).

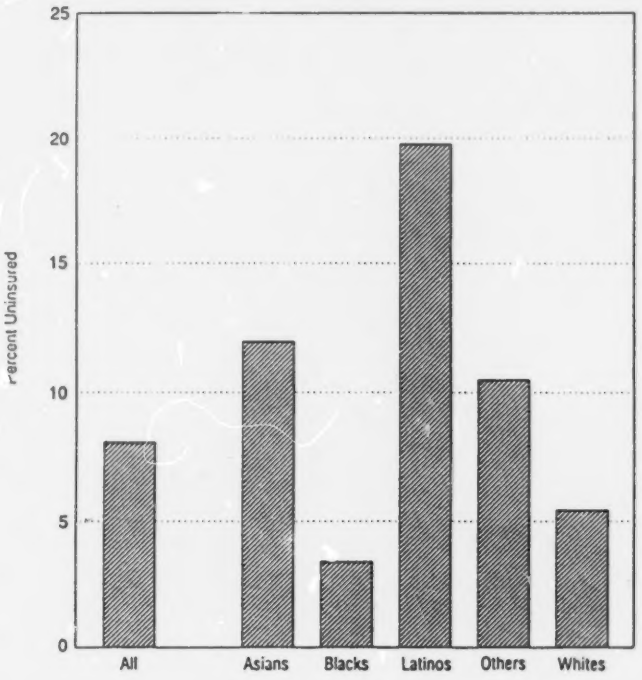
The risk associated with being uninsured was especially high for black and Latino newborns. Uninsured black newborns were 2.24 times as likely as privately insured black newborns to experience adverse outcomes; for uninsured Latino newborns the risk was 1.56 times greater. The relative risk for white and Asian uninsured newborns increased

FIGURE 1
PERCENT OF NEWBORNS THAT ARE UNINSURED[1]

(a) PERCENT OF ALL NEWBORNS UNINSURED,[1] 1982, 1984, AND 1986



(b) PERCENT OF NEWBORNS UNINSURED[1] IN 1986, OVERALL AND BY RACE/ETHNICITY



[1]No public or private coverage.

significantly in 1984, but this trend did not continue. See Figure 2(b).

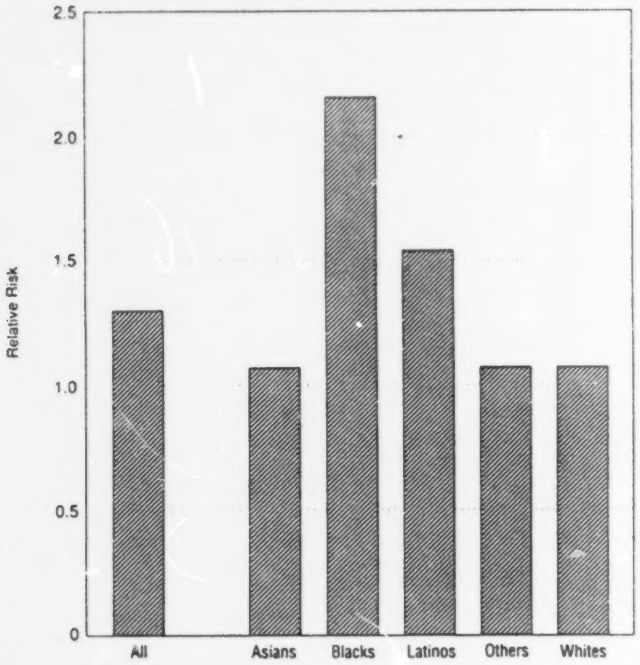
Compared to privately insured white newborns, uninsured minority newborns showed significantly higher risks. For example, when compared with privately insured white newborns, uninsured black newborns were nearly twice as likely to have adverse outcomes in 1982 and more than four times as likely to have adverse outcomes in 1986. Similarly, when compared with privately insured white newborns, uninsured Latino newborns were approximately 1.4 times more likely to have adverse outcomes. Risks for uninsured Asians were significantly and consistently greater relative to privately insured white newborns, but did not change appreciably over time. See Figure 3. When the analysis was repeated to control for type of hospital (public versus private), lack of insurance continued to be associated with adverse outcomes for newborns.

DISCUSSION

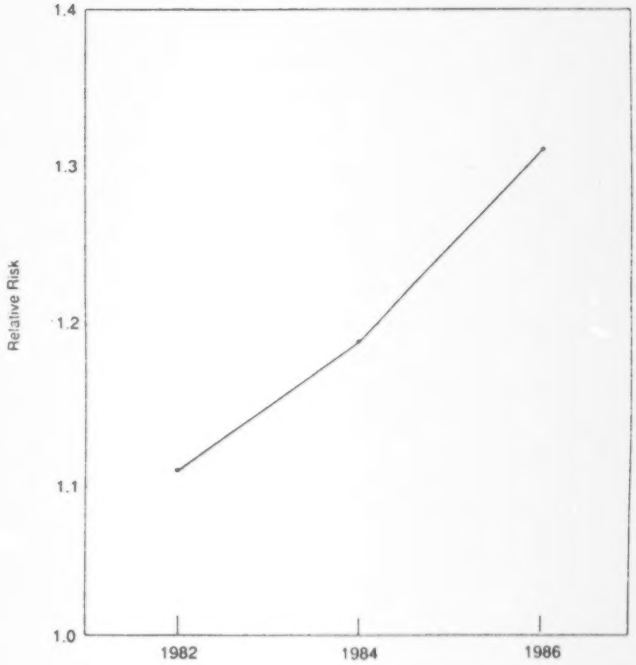
The findings indicate that lack of health insurance is related — and increasingly related over time — to adverse outcomes for hospitalized newborns, particularly for black and Latino newborns. The prevalence of lack of insurance increased over time, especially among Asians and Latinos. The burden of the problem fell heavily on Latinos, who by 1986 had a high prevalence of being uninsured and, like blacks, a high magnitude of associated risk.

FIGURE 2
RELATIVE RISK OF AN ADVERSE HOSPITAL OUTCOME[1] FOR UNINSURED[2] VERSUS PRIVATELY INSURED NEWBORNS

(a) RISKS FOR ALL NEWBORNS,[3] 1982, 1984, AND 1986



(b) RISKS FOR ALL NEWBORNS[3] AND BY RACE/ETHNICITY, 1986



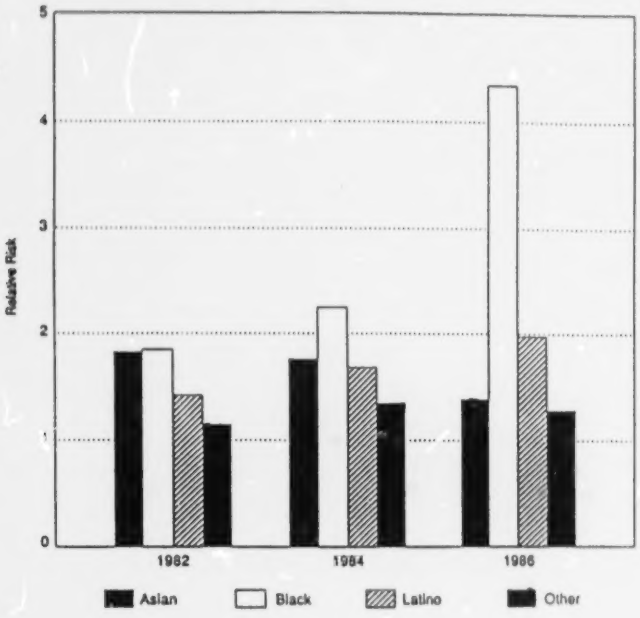
[1]Prolonged stay, transfer, or death.
[2]No public or private coverage.
[3]Controlling for race/ethnicity and plurality in all years.

Racial/ethnic disparities in insurance coverage are consistent with the disproportionate concentration of persons of color in jobs that do not provide health insurance benefits. Because of more prevalent and severe poverty, blacks were more likely to meet Medi-Cal criteria, and therefore had a lower proportion of uninsured. The increasing proportion of newborns without health insurance over time suggests increasing deficits in coverage for maternity and perinatal care.

The elevated and increasing risk of adverse outcomes found for uninsured newborns is probably explained by the diminished access to care *in concert* with other factors related to socioeconomic status that this study did not take into account. For example, black and Latino women are more likely to be poor, single heads of household. Lower socioeconomic status is often related to poor health, including adverse birth outcomes. Thus, those with greater health needs are less likely to have private health insurance and more likely to experience other social and practical barriers (such as lack of child care and transportation) related to obtaining health care.

Because the analysis controlled for race/ethnicity, the observed difference in risks over time cannot

FIGURE 3
RELATIVE RISKS OF AN ADVERSE HOSPITAL OUTCOME[1] FOR UNINSURED[2] MINORITY NEWBORNS COMPARED WITH PRIVATELY INSURED WHITES[3]



[1]Prolonged stay, transfer, or death.
[2]No public or private coverage.
[3]Controlling for plurality in all years and anomaly after 1982.

be attributed to changes in the prevalence of risk factors related to the racial/ethnic distribution of the uninsured. A growing proportion of the overall population is uninsured, including increasing percentages of employed persons and their dependents, who are less likely to have chronic medical conditions. Thus, uninsured pregnant women in 1986 were unlikely to have experienced any increase in medical risk factors compared with uninsured pregnant women in 1982.

It is also unlikely that increases in adverse outcomes for uninsured newborns can be explained by the increased use of "crack" cocaine during pregnancy. The crack epidemic was not perceived as a serious problem in the Bay Area before 1986, but elevated risks for uninsured newborns were found in 1982 and 1984, along with a significant trend toward an increasing magnitude of risk from 1982 on. Furthermore, increased risks relative to privately insured white newborns were found among all uninsured minorities, including Asians, an ethnic group in which substance abuse has not been especially prevalent.

The increase in poverty levels reported in the literature may have affected the uninsured, potentially increasing socioeconomic risks related to health outcomes. Disproportionate increases in poverty among blacks and Latinos may explain the widening gap in risk level over time between uninsured black and Latino infants and privately insured white infants.

These changes in risks over time and in relation to access to care bespeak the importance of factors that are sensitive to changes in policy and programs. Elevated, increasing risks among the uninsured are likely to be related both to lack of access to private medical care and the reduction in public services, which appreciably declined in the 1980s. Increasing poverty has probably exacerbated the effects of decreased access tor those groups most vulnerable to reductions in the public health safety net.

Immediate costs of hospitalization associated with excess adverse outcomes in uninsured newborns were high (see Table 1), and do not include the costs of repeated acute care or chronic care shown in other studies to be associated with adverse neonatal outcomes. The costs of loss of life and suffering and loss of an infant's full potential for intellectual and physical development and well-being cannot be quantified, but should be considered when interpreting this study's results.

CONCLUSIONS

While other studies have shown that lack of health insurance and inadequate prenatal care are prevalent and increasing, these results are the first

TABLE 1
MEAN TOTAL CHARGES FOR NEWBORN HOSPITALIZATION, BY OUTCOME[1]

	1984	*1986*
Discharged home after stay, less than 6 days	$751	$827
Discharged home after stay, 6 days or more	$9,975	$14,411
Transfer to other acute hospital[2]	$58,125	$55,818
Death	$11,336	$10,889

[1]Data on total charges unavailable for 1982.
[2]Estimated by adding mean costs at hospital of birth to mean costs at destination hospital for neonates admitted as transfers at age of at least 2 days. Does not include transfers to long-term care facilities.

to demonstrate an association between lack of insurance and adverse neonatal health outcomes. Not only was lack of health insurance in newborns associated with an elevated risk of adverse hospital outcomes, but in addition both the prevalence of being uninsured and the magnitude of the associated risk increased over time. Findings indicate problems for uninsured newborns in general and for uninsured black and Latino newborns in particular, the groups in whom poverty is most likely to exacerbate the effects of lack of access to care. Risks were shown to be elevated for Latino newborns, a group for whom traditional indicators in vital statistics (low birth weight, infant mortality) have been favorable.

The findings strengthen the argument for a decisive response to the increasing problem of lack of health insurance in California and in the United States. Changes in policy must address the inequities in access to care and in socioeconomic conditions that are associated with differences in infants' chances for life and health, according to ability to pay.

Paula Braveman, M.D., M.P.H., is assistant professor, Marie Grisham Miller, D.S.W., was a member of the research staff, and Susan Egerter, Ph.D., is an epidemiologist at Family and Community Medicine, School of Medicine, UC San Francisco. Geraldine Oliva, M.D., M.P.H., is director of family health and Randy Reiter, Ph.D., M.P.H., was an epidemiologist at the Department of Public Health, City and County of San Francisco.

Research for the study was supported in part by a grant from the W. K. Kellogg Foundation. The information presented here is being circulated by the California Policy Seminar as a service to state government. To receive a copy of the full article, contact Dr. Paula Braveman at Family and Community Medicine, School of Medicine, Box 0900, University of California, San Francisco, CA 94143. Please address inquiries about CPS activities and publications to the California Policy Seminar, 2020 Milvia Street, Suite 412, Berkeley, CA 94704, or telephone (510) 642-5514 or ATSS 8/582-5514.